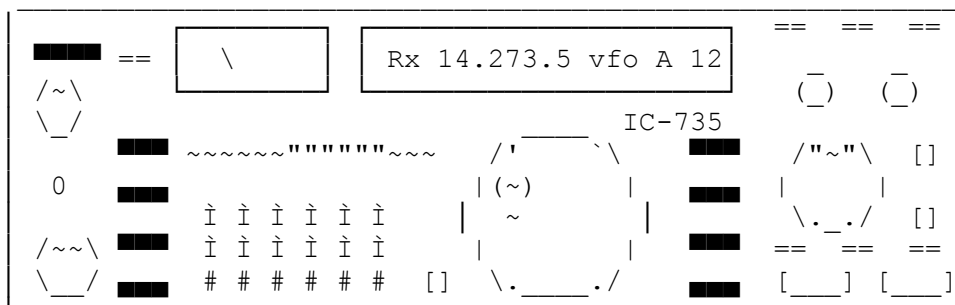


PA instability in ICOM IC735

By G8MNY

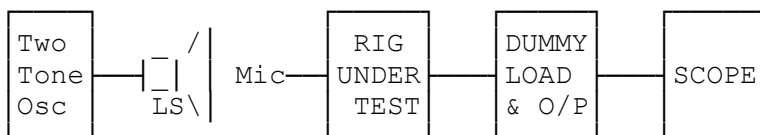
(Updated Apr 16)

(8 Bit ASCII graphics use code page 437 or 850, Terminal Font)



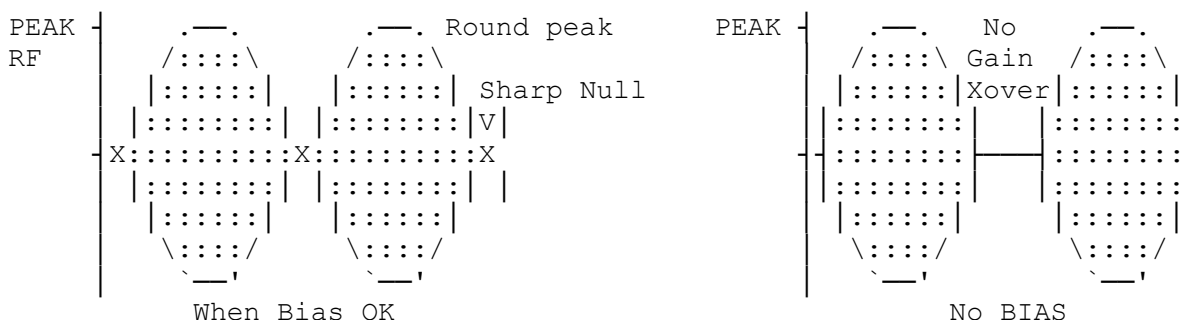
I have 2 of these rigs, an old one for /P use, & a clean one in the shack. I've been looking into a problem with my newer clean shack one. It has developed a fault (may have always been there?), on long overs, on low power, the Tx gain goes down & results in distorted Tx AF.

Using 2 tone testing (Mic processor off), I checked the 2 stage push pull bias & it seemed to be thermally vicious cutting off the driver & PA when warm.

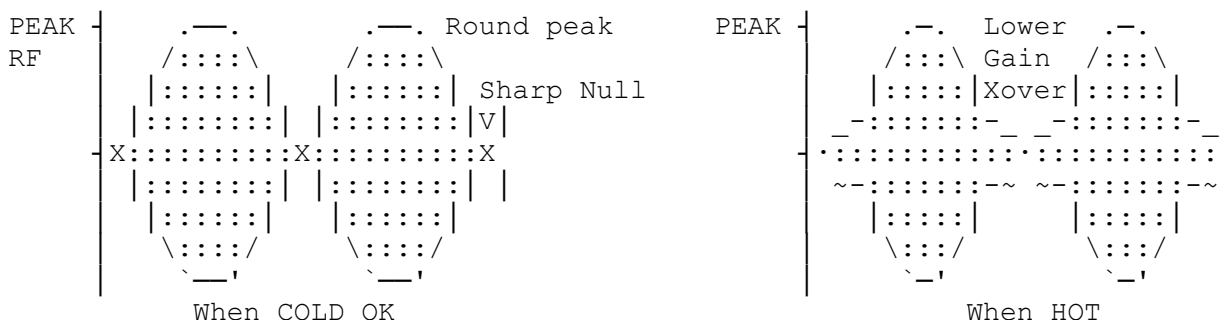


So I had previously turned up the PA bias to be OK on 50W 2 tone HOT, e.g. too much standing current when cold! But this only delayed the problem, not fixed it!

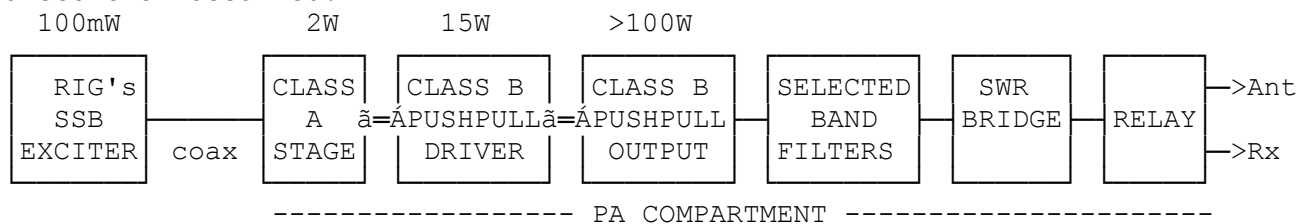
On a different IC735 I had seen PA Bias failure of the Bias emmitter follower & that produced the typcal no RF output at low levels..



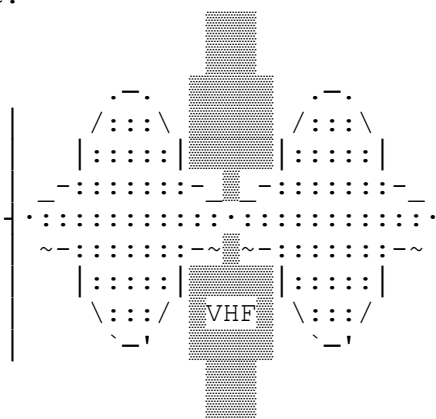
But this fault was confusing..



So I have had another look at the problem, with a 100MHz scope, & I looked at the class A stage in the PA unit. I saw it was "taking off" @ VHF when the distortion occurred!



The parasitic oscillation is above HF so it does not get far in the rig. The fault is nothing to do with the class B driver bias as I thought, except that affects the load seen through the driver transformer from the push pull class B stage.



Class A Stage's Collector

The instability of the class A stage at VHF is affected by class B driver stage's bias setting!

What seems to be happening when hot, is that stage takes off until the HF drive causes load to be seen on the collector then it stops or reduces.

The net effect is the HF gain is reduced at the low level crossover part of the 2 tone signal.

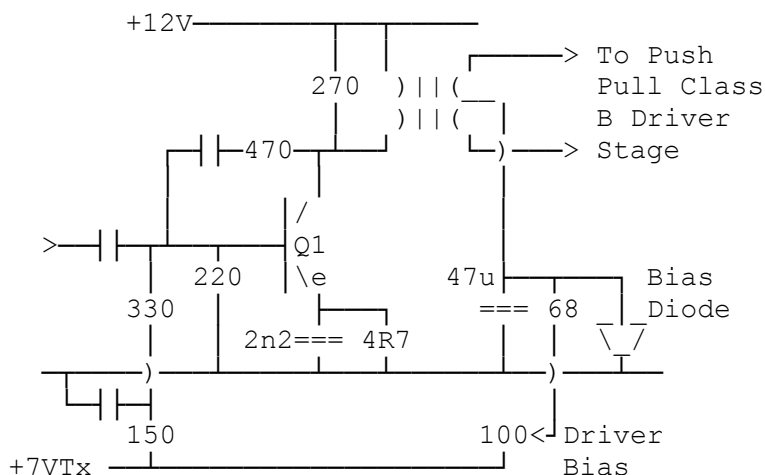
THE CURE

I doubled the NFB base to collector by paralleling another 470R across the 470R & all was then tame.

Q1 transistor seemed to have too much VHF gain in this stage when hot & caused the oscillation!

Component tests around this stage found nothing wrong!

CLASS A STAGE CIRCUIT



See my TECH Bul "AF 2 Tone Test Osc Design", "QRO 1kW HF Metered Dummy Load", "IC 735 No RF Output", "IC 735 Battery Backup Mod", & "Autocaller with old Maplin kit"

Why don't U send an interesting bul?

73 de John G8MNY @ GB7CIP